

Form PTO-1449 U.S. DEPARTMENT OF COMMERCE (REV. 7-80) PATENT AND TRADEMARK OFFICE				Atty. Docket No. (Optional) 9872Y		Application Number Unassigned	
INFORMATION DISCLOSURE CITATION <i>(Use several sheets if necessary)</i>				Applicant(s) Ted Christopher			
				Filing Date Herewith		Group Art Unit Unassigned	
				U.S. PATENT DOCUMENTS			
EXAMINER INITIAL*		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE (if appropriate)
R. D.	1.	4,012,950	3/22/77	Kompfner, et al.			
	2.	5,608,690	3/4/97	Hossack, et al.			
	3.	5,255,683	10/26/93	Monaghan			
	4.	5,410,516	4/25/95	Uhlmdorf, et al.			
	5.	5,879,303	3/9/99	Averkiou, et al.			
	6.	5,526,816	6/18/96	Arditi			
	7.	5,724,976	3/10/98	Mine			
	8.	4,483,345	11/20/84	Miwa			
	9.	4,620,546	11/4/86	Aida			
	10.	4,865,042	9/12/89	Umemura, et al.			
	11.	5,158,071	10/27/92	Umemura, et al.			
	12.	5,435,311	7/25/95	Umemura, et al.			
	13.	5,034,931	7/23/91	Wells			
	14.	4,714,846	12/22/87	Pesque, et al.			
	15.	4,702,258	10/27/87	Nicolas, et al.			
	16.	5,706,819	1/13/98	Hwang, et al.			
	17.	5,897,500	4/27/99	Zhao			
	18.	5,846,202	12/8/98	Ramamurthy, et al.			
	19.	5,833,614	11/10/98	Dodd, et al.			
	20.	5,833,613	11/10/98	Averkiou, et al.			
	21.	5,740,128	4/14/98	Hossack et al.			
	22.	5,577,505	11/26/96	Brock-Fisher, et al.			
	23.	5,396,285	3/7/95	Hedberg, et al.			
	24.	5,313,948	5/24/94	Murashita, et al.			
R. D.	25.	5,111,823	5/12/92	Cohen			

26.	4,610,255	9/9/86	Shimura, et al.			
27.	5,456,257	10/10/95	Johnson, et al.			
28.	5,540,909	7/30/96	Schutt			
29.	5,628,320	5/13/97	Teo			
30.	5,628,322	5/13/97	Mine			
31.	5,632,277	5/27/97	Chapman, et al.			
32.	6,023,977	2/15/00	Langdon, et al.			
33.	5,415,175	5/16/95	Hanafy, et al.			


FOREIGN PATENT DOCUMENTS

REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
34.	8-294487	11/12/96	Japan				
35.	851 241 A2	7/1/98	Europe				
36.	WO 96/13213	5/9/96	PCT				
37.	0770 352 A1	5/2/97	Europe				
38.	WO 91/15999	10/31/99	PCT				
39.	WO 8002365	11/13/80	PCT				
40.	226044	6/24/87	Europe				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

41.	Averkiou, et al., (1995), "Measurements of Harmonic Generation in a Focused Finite-Amplitude Sound Beam", <u>J. Acoust. Soc. Am.</u> 98(6), pp. 3439-3442
42.	Baker, et al., (1997), "Nonlinear Propagation Applied to the Improvement of Resolution in Diagnostic Medical Ultrasound", <u>J. Acoust. Soc. Am.</u> 101(1):143-154
43.	Baker, et al., (1995), "Non-Linear Propagation Applied To The Improvement of Lateral Resolution In Medical Ultrasound Scanners", 1995 World Congress On Ultrasonics, pp. 965-968
44.	Baker, et al., (1988), "The Nonlinear Pressure Field of a Plane Circular Piston: Theory and Experiment", <u>J. Acoust. Soc. Am.</u> 84(4)
45.	Bjorno L. et al., (1982), "Nonlinear Focusing Effects in Ultrasonic Imaging", Ultrasonics Symposium Proceedings, Vol. 2:659-662
46.	Chang, et. al., (1994), "Second Harmonic Imaging and Harmonic Doppler Measurements with Alunex", 1994 Ultrasonics Symposium, pp. 1551-1554
47.	"Errors in Attenuation Measurements Due to Nonlinear Propagation Effect," Zeqiri, <u>J. Acoust. Soc. Am.</u> 91 (5), pp. 2585-2593, May 1992

2.2.	48.	"Harmonic Generation in Finite Amplitude Sound Beams from a Rectangular Aperture Source," Kamakura, et al., <u>J. Acoust. Soc. Am.</u> 91 (6), pp. 3144-3151, June 1992
	49.	"The Enhancement of Second Harmonic Generation In Ultrasonic Microscopic Observation By Triple Transition," Din, et al., 1993 <u>Ultrasonic Symposium</u> , pp. 575-578
	50.	"Non-Linearity and Finite Amplitude Effects," <u>European Journal Of Ultrasound</u> , 1 pp. 215-219, 1994
	51.	"Time-Shift Compensation of Ultrasonic Pulse Focus Degradation using Least-Mean-Square Error Estimates of Arrival Time," Liu, et al., <u>The Journal of the Acoustical Society of America</u> , Vol. 95, No. 1, pp. 542-555, January 1994
	52.	"Adaptive Focusing in Scattering Media through Sound-Speed Inhomogeneities: The van Cittert Zernike Approach and Focusing Criterion," Mallert, et al., <u>J. Acoust. Soc. Am.</u> , 96 (6), pp. 3721-3732, December 1994
	53.	"Wavefront Amplitude Distribution in the Female Breast," Zhu, et al., <u>J. Acoust. Soc. Am.</u> , 96 (1), pp. 1-9, July 1994
	54.	"An Experimental Investigation of the Nonlinear Pressure Field Produced by a Plane Circular Piston," TenCate, <u>J. Acoust. Soc. Am.</u> 94 (2), Pt. 1, pp. 1084-1089, August 1993
	55.	"New Approaches to Nonlinear Diffractive Field Propagation," Christopher, et al., <u>J. Acoust. Soc. Am.</u> 90 (1), pp. 488-499, July 1991
	56.	"Imaging the Acoustic Nonlinearity Parameter with Finite-Amplitude Sound Waves: The Difference-Frequency Method and the Second-Harmonic Method," Y. Nakagawa, et al., <u>IEICE Transactions</u> , Vol. E71, No. 8, pp. 799-809 August 1988
	57.	"Second Harmonic Imaging and Harmonic Doppler Measurements with Alburnex," Chang, et al., <u>1994 Ultrasonics Symposium</u> , pp. 1551-1554
	58.	"In Vivo and In Vitro Ultrasound Beam Distortion Measurements of a Large Aperture and a Conventional Aperture Focused Transducer," Moshfeghi, et al., <u>Ultrasound in Med and Biol.</u> , Vol. 14, No. 5, pp. 415-428, 1988
	59.	"Physical Acoustics: Ultrasonic Techniques," Makin, <u>J. Acoust. Soc. Am.</u> Vol. 97, No. 5, Pt. 2, May 1995
	60.	"Generation of Harmonics in a focused Gaussian sound field," Du, et al., <u>J. Acoust. Soc. Am.</u> 97 (3), pp. 1486-1488, March 1995
	61.	"Nonlinear Propagation in Doppler Ultrasound," McDicken, et al., <u>Ultrasound in Med & Biol.</u> , Vol. 19, No. 5, pp. 359-364, 1993
	62.	"Multi-Frequency Transducer Assembly for Nonlinear Ultrasonic Measurements," Wu, et al., <u>J. Acoust. Soc. Am.</u> 93 (4), Pt. 1, pp. 2231-2234
2.2.	63.	Ward, B. et al., (1995) "Non-Linear Propagation Applied to the Improvement of Lateral Resolution in Medical Ultrasound Scanners," <u>1995 World Congress on Ultrasonics</u> , pgs. 965-968

A.C.	64.	Ward, B. et al. (1997) "Nonlinear Propagation Applied to the Improvement of Resolution in Diagnostic Medical Ultrasound", <u>J. Acoust. Soc. Am.</u> 101 (1): 143-154
	65.	Fosberg, F. (1993) "In Vivo Application of Contrast-Enhanced Harmonic Imaging" <u>Radiological Society of North America</u> , Abstract No. 1047
	66.	Parker, Kevin J., "Observations of Nonlinear Acoustic Effects in a B-Scan Imaging Instrument", <u>IEEE Transactions on Sonics and Ultrasonics</u> , Vol. SU-32: No. 1 (1985)
	67.	Dunn, et al., (1981), "Ultrasonic Determination of the Nonlinearity Parameter B/A for Biological Media" <u>J. Acoust. Soc. Am.</u> 69(4), pp. 1210-1212
	68.	"Modeling Acoustic Field Propagation for Medical Devices" (1993) PhD. Thesis by Dr. Ted Christopher
	69.	J.Y. Chapelon et al., <u>Ultrasonics</u> , "Bubble Detection and Sizing with a Double Frequency Doppler System" Vol. 26, May 1988, pp. 148-154
	70.	D. Cathignol, et al., "Bubble Sizing with High Spatial Resolution" <u>IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control</u> , Vol. 37, no. 1, pp. 30-37, January 1990
	71.	D.L. Miller "Ultrasonic Detection of Resonant Cation Bubbles in a Flow Tube by Their Second-Harmonic Emissions", <u>Ultrasonics</u> , Vol. 19, pp. 217-224, September 1981
A.C.	72.	Schrope, B. et al. (1992) "Simulated Capillary Blood Flow Management Using a Nonlinear Ultrasonic Contrast Agent", <u>Ultrasonic Imaging</u> , Vol. 14:134-158
EXAMINER 	DATE CONSIDERED <u>4/17/5</u>	
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.		